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A new generation of women veterans: Stressors faced by women deployed to Iraq and Afghanistan

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ABSTRACT

The extent of female service members' involvement in Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), in terms of both the number of women deployed and the scope of their involvement, is unprecedented. While many of the mental health readjustment issues of female service members are likely to mirror those of the majority male Veteran population, this newest generation of women Veterans may also face unique threats to their mental health. The goal of this review it to highlight emerging issues relevant to the development of posttraumatic stress disorder (PTSD) among women deployed to Iraq and Afghanistan by reviewing the existing literature on gender-relevant issues among this cohort, as well as raising theoretically important issues that are worthy of further empirical investigation. Topics addressed include gender differences in combat experiences and in PTSD following combat exposure; sexual assault, sexual harassment and other interpersonal stressors experienced during deployment; women Veterans' experiences of premilitary trauma exposure; and unique stressors faced by women Veterans during the homecoming readjustment period. Given that most models of the impact of war zone deployment on PTSD are predicated on the experiences of male service members, women's expanding role in combat operations presents both an opportunity and a challenge to adapt these models to more effectively capture the experiences of female service members.

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When considering posttraumatic stress disorder (PTSD) associated with deployment in support of Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF) in Iraq, it is critical to consider the increasingly important role being played by female

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service members. While many of the mental health readjustment issues of female service members are likely to mirror those of the majority male Veteran population, this newest generation of women Veterans may also face unique threats to their mental health. Currently, women represent a larger proportion of U.S. military forces than ever before, comprising approximately 14% of forces deployed in support of OEF/OIF, representing over 180,000 deployed female troops (Department of Defense, 2008).

Women's involvement in combat operations is certainly not a new phenomenon. Women have served with distinction in every U.S. military conflict since the Revolutionary War (Goldstein, 2001). Women played an important role in the Vietnam War effort (1965–1973), serving primarily as nurses or in clerical roles. Reflecting women's generally lower status in the military at that time, during much of the Vietnam War women's enlistment was capped at 2% of total forces and there were significant limits placed on female service members' rank attainment (Murdoch et al., 2006).

Female troops played a much larger role in the Gulf War (1990–1991). For this combat operation women comprised about 11% of total military forces, with less than half of women serving in administrative or medical roles (Murdoch et al., 2006). Women were deployed in key combat support positions, including serving as military police, on warships, and flying refueling and fighter planes. Evidence of women's expanded role in the Gulf War can be seen in data indicating that approximately equal numbers of men and women experienced at least one combat exposure during this combat operation (Carney et al., 2003).

Following the Gulf War, changes in Department of Defense policy and new legislation enacted by Congress eased rules excluding women from combat-related positions, making over 90% of military occupations available to women (Donegan, 1996). Perhaps as a consequence, women's roles in the current conflicts in Iraq and Afghanistan have expanded well beyond their roles in previous conflicts, both in terms of the number of women involved and the nature of their involvement. While women deployed to Iraq and Afghanistan are still officially barred by Department of Defense policy from serving in direct combat positions (e.g., Marine and Army infantry), this regulation does not protect women from exposure to combat situations given a war with no front line, in which women serve in a variety of support positions that involve leaving military bases, working side-by-side with combat soldiers, and coming under direct fire (Hoge, Clark, & Castro, 2007). Women now hold positions such as military police, convoy transportation, intelligence, pilots, medics and mechanics, which put them at risk for exposure to combat experiences. The distinction between combat and non-combat roles holds even less meaning in wars like the ones in Iraq and Afghanistan, which have been characterized by guerrilla fighting in urban war zones with no clear front lines. The increasing role of women in combat, and the associated danger of these roles, is reflected in statistics indicating that, to date, there have been 634 women wounded in action and 121 women killed in action while deployed in support of OEF/OIF (Department of Defense, 2009). Female troops comprise 2.1% of all troop death during OEF and 2.4% of all troop deaths during OIF (Fischer, 2009).

The goal of this review it to highlight emerging issues relevant to the development of PTSD among women deployed to Iraq and Afghanistan. The empirical literature addressing issues of particular relevance for female service members deployed in support of OEF/OIF, including the evaluation of gender differences in PTSD following deployment among OEF/OIF troops, is extremely limited. Nonetheless, this review represents an opportunity to review the existing literature on gender-relevant issues among this cohort, as well as to raise theoretically important issues that are worthy of further empirical investigation. In addition, when relevant, we have highlighted empirical literature from earlier combat cohorts as well as data from civilian samples that may shed light on issues of relevance to the newest generation of women warriors.

1. Combat experiences in Iraq and Afghanistan

Deployment in support of OEF/OIF can involve exposure to a range of potentially stressful or traumatic experiences, including stressors specific to being in a war zone, difficulties related to being separated from loved ones, and interpersonal stressors associated with living and working in close proximity with other troops. Although research interest in these latter two stressor categories has grown over the past decade, most of the deployment health research to date has focused on understanding the consequences of war-zone stressors and combat exposure more specifically. Combat experiences may include events such as being attacked or ambushed, being fired on or firing on enemies, and witnessing the injury and death of other military personnel, enemy combatants, and civilians. Combat exposure is extremely common among military personnel deployed in support of OEF and OIF. In one recent study that included over 88,000 OIF soldiers who completed the military's Post-Deployment Health Assessment, 67% to 70% of study participants reported at least one combat experience (Milliken, Auchterlonie, & Hoge, 2007). Although gender differences in combat experiences were not reported in this study, given the ratio of men to women in the sample (9 to 1), these rates are likely to be more descriptive of men's deployment experiences. Research findings indicate that female service members experience less combat exposure, on average, compared with male service members (Tolin & Foa, 2006), in part due to the fact that women are excluded from direct ground combat positions. This is changing, however, as women are increasingly serving in roles that put them at risk for combat-related experiences. Moreover, both OEF and OIF deployments have been characterized by insurgency warfare, in which there is no front line and enemy attacks can come in many forms. This has led to unprecedented levels of combat exposure for female service members, and raises the questions of how women's and men's combat experiences differ and whether combat exposure impacts women and men differently.

1.1. Gender differences in combat exposure

Few studies have specifically examined gender differences in combat exposure within OEF/OIF Veteran samples. Those studies that have addressed this research question generally suggest that women experience lower rates of combat exposure than men (Mental Health Advisory Team — IV, 2006; Rona, Fear, Hull, & Wessely, 2007). Although rates of exposure to combat are lower for women, findings suggest that women may be experiencing substantial levels of combat exposure. Among OIF soldiers deployed as part of infantry and combat support units, 12% of women were classified as experiencing moderate levels of combat exposure and 3% were classified as having had high levels of combat exposure based on their self-reports of combat experiences (Mental Health Advisory Team — IV, 2006). Comparable rates were not reported for male service members in this study. In a random sample of UK Armed Forces deployed to Iraq, 16% of women reported that they came under small arms fire, 40% reported that they came under mortar/artillery fire, and 37% indicated that they saw seriously hurt personnel (Rona et al., 2007). Although rates of reported exposure were higher for men in this sample (26%, 54%, and 45%, respectively), these findings still represent substantial exposure to circumstances of combat, and underscore the importance of attending to women's experiences of combat within the OEF/OIF Veteran cohort.

As suggested in a recent review of research on women Veterans (Zinzow, Grubaugh, Monnier et al., 2007b), a more in-depth understanding of gender differences in combat exposure can be obtained by examining the specific combat experiences that are more or less common for women versus men. While few studies have addressed gender differences in specific combat experiences in Iraq and Afghanistan and to our knowledge, no epidemiological data is available on this research question, one study that addressed this

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question in a sample of male and female combat support troops deployed to Iraq or Kuwait revealed several interesting differences (Hoge et al., 2007). Women were more likely than men to report handling human remains (38% and 29%, respectively). In contrast, 36% of women compared to 47% of men reported being in fire fights, and 7% of women compared to 15% of men reported shooting at or directing fire at the enemy. These findings suggest that, at least for this combat support unit, women may have been more likely to experience circumstances associated with the aftermath of battle, whereas men's combat experiences were more likely to involve active engagement in combat. To the extent that these results generalize to the population more broadly, this finding suggests the possibility of differential implications for postdeployment mental health for women and men. For example, one might hypothesize that women's less active role in combat puts them at greater risk for maladaptive reactions, as direct combat roles may be associated with a higher sense of control and perceived control has been found to be protective in the occupational health literature (Spector, 1986). Alternatively, it could be the case that more active involvement in combat is detrimental to mental health, as such involvement may be associated with a greater sense of responsibility or guilt when these activities involve putting others at risk of injury or death. Below, we review findings with regard to potential gender differences in associations between combat exposure and postdeployment health.

1.2. Effects of combat on mental health

Quite understandably, given men's greater exposure to circumstances of combat, most of the prior research on the effects of combat exposure on mental health outcomes has either focused exclusively on men or included only a small subset of women in their samples. Thus, there are few studies that can be consulted to draw conclusions regarding the differential impact of combat exposure on women and men. An examination of the broader literature on gender differences in trauma exposure and its consequences would suggest, however, that women might be more negatively affected by combat exposure. As indicated in a recent meta-analysis of gender differences in trauma and PTSD, women are more likely than men to meet criteria for PTSD following a range of different types of traumatic experiences, and this difference cannot be explained by a higher risk for traumatic events more generally, nor can it be entirely accounted for by a higher risk for more severe traumatic events, like sexual abuse (Tolin & Foa, 2006). Among the 11 studies that reported gender differences in PTSD following combat exposure, this effect was much more modest, with a marginally significant difference such that women reported greater PTSD symptomatology than men. While this finding might suggest that women are at least slightly more vulnerable to the effects of combat exposure, it is important to note that this meta-analysis did not include OEF/OIF Veteran samples. Instead, the studies that were included in this meta-analysis focused on prior cohorts, for which women's combat exposure was almost certainly more modest than that experienced by women deployed to Iraq and Afghanistan. As a consequence, these findings may not generalize to this most current cohort.

Although research is not yet available on the longer-term implications of the Iraq and Afghanistan deployments for the health and well-being of returning Veterans, results based on studies that have evaluated this research question within a few years following return from deployment have revealed that many, though not all, Veterans struggle with mental and physical health problems following deployment (e.g., Hoge, Auchterlonie, & Milliken, 2006; Hotopf et al., 2006; Milliken et al., 2007; Tanielian & Jaycox, 2008). Also consistent with prior research, results have revealed a positive association between combat exposure and posttraumatic stress symptomatology (e.g., Grieger et al., 2006; Hoge et al., 2006; Hoge et al., 2004; Hotopf et al., 2006; Kolkow, Spira, Morse, & Grieger, 2007). Although the strength of this relationship varies considerably across different studies, the finding of a statistically significant association appears to be robust across the various ways of operationalization of posttraumatic stress symptomatology applied in different studies (e.g., self-report vs. clinician-administered interview, brief screening tools vs. comprehensive assessments). Unfortunately, however, few studies with this cohort have examined gender differences in the relationship between combat exposure and associated mental health consequences. Additionally, for the most part, those studies that include relevant data were not specifically designed to address gender differences, and therefore, are somewhat limited in the conclusions that can be drawn. Below, we group the relevant literature into three categories, review findings from each category, and discuss the conclusions that can be drawn based on each study type. We focus this review primarily on studies that have examined PTSD as the focal outcome, given that this is a key outcome of war exposure.

1.3. Study type 1: Studies that report gender differences in PTSD

Many of the OEF/OIF studies that have included comparisons between women and men involve computing estimates of mental health symptomatology separately for women and men. In general, results have revealed nonsignificant or small differences in postdeployment mental health problems between women and men. For example, in a study of female and male OIF soldiers and male Marines deployed from infantry and combat support units in 2006, similar rates of women and men met criteria for PTSD (12% and 13% respectively, MHAT-IV, 2006). Likewise, similar levels of posttraumatic stress symptomatology were found for women and men within a sample of UK Armed Forces deployed to Iraq (Rona et al., 2007) and among U.S. soldiers returning from a 12-month deployment to Iraq or Afghanistan (LaPierre, Schwegler, & LaBauve, 2007). Studies based on samples of VA users have identified similar results. Among OEF/OIF Veterans seen at Department of Veterans Affairs facilities, Seal, Bertenthal, Miner, Sen, and Marmar (2007) found minimal differences between women and men regarding risk for receiving PTSD diagnoses (11% and 13%, respectively), with rates that were similar to those reported for the study of infantry and combat support units described previously, as did Kang and Hyams (2005) in their examination of gender differences in a similar sample.

Based on these findings, researchers have concluded that combat deployments are not associated with a higher risk of mental health problems for women compared to men. However, a lack of differences in postdeployment PTSD may not necessarily mean that combat exposure has the same impact on women's and men's mental health. Postdeployment PTSD may be influenced by a number of factors besides deployment to a war zone. Therefore, studies that consider other variables that may influence the relationship between war-zone deployment and PTSD symptomatology provide more nuanced results. Given some evidence that women are more likely than men to suffer from predeployment mental health problems (Hourani & Yuan, 1999; Smith, Ryan, 2008a), some studies have controlled for predeployment differences in mental health status. For example, Smith and colleagues (2008a) found that female gender was associated with postdeployment PTSD in a population-based sample of OEF/OIF Veterans after accounting for preexisting differences in PTSD. While studies of this nature provide more comprehensive information with respect to the question of gender differences in the effects of combat by eliminating other potential explanatory factors, these findings still do not directly address the impact of combat exposure on mental health outcomes. In the next section we review studies that have taken into account the amount of combat exposure experienced by men and women in their examination of gender differences in posttraumatic stress symptomatology.

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1.4. Study type II: Studies that account for the role of combat exposure in the examination of gender differences

One approach to address the role of combat exposure in accounting for the relationship between gender and PTSD is to examine the impact of gender on PTSD after controlling for differential combat exposure by including a measure of combat exposure as another predictor in the model. A study that controlled for combat exposure, as well as other demographic characteristics that could serve as confounders, revealed that women Veterans were more likely than their counterparts to meet screening criteria for PTSD following deployment to Iraq or Afghanistan (Tanielian & Jaycox, 2008). Another relevant investigation that examined probable PTSD in a sample of female and male OIF Veterans restricted to combat support units, which identified similar rates of probable PTSD for women and men (12% versus 11%, respectively) (Hoge et al., 2007).

While studies of this nature provide results that are more relevant to the question of whether there are gender differences in the relationship between combat exposure and mental health than studies in the first category, they do not directly address the question of whether the relationship between gender and PTSD varies across different levels of combat exposure. Instead, studies that control for combat exposure address the extent to which the effect of gender on PTSD is the same for women and men when combat exposure is zero (or if the combat exposure variable is centered at the average level of combat exposure). Similarly, analyses that involve restricting the sample to women and men in similar deployment roles are useful for understanding gender differences given a particular type of combat exposure (in this case, combat support), but they do not address whether the association between gender and mental health outcomes varies across different levels of combat exposure. In the next section, we review studies that more directly address this question.

1.5. Study type III: Studies that examine gender differences across different levels of combat exposure

One approach to examining gender differences in the impact of combat exposure is to examine whether gender moderates the relationship between combat exposure and PTSD. This analysis would involve creating an interaction term between a continuous measure of combat exposure and gender and examining whether there is an association between this interaction term and PTSD. Although no studies of this nature were identified in the published literature on OEF/OIF Veterans, a number of earlier studies based on Vietnam Veterans and Gulf War Veterans have taken this approach. However, findings based on these studies have been mixed. For example, among Vietnam Veterans, combat exposure demonstrated a stronger positive indirect association with PTSD, through its influence on perceived threat, for women than for men (King, King, Gudanowski, & Vreven, 1995). Consistent with this finding, among Gulf War Veterans, exposure to death and accidents was more strongly associated with women's scores on a measure of PTSD symptomatology compared to men (Wolfe, Brown, & Kelley, 1993). In contrast, two other studies found no evidence for differential associations between combat experiences and posttraumatic stress symptomatology for women and men deployed to the Gulf War (Sutker, Davis, Uddo, & Ditta, 1995; Vogt, Pless, King, & King, 2005). Importantly, all studies of Gulf War Veterans are limited by the fact that women's exposure to combat experiences was likely much lower in this cohort than in the more contemporary cohort of OEF/OIF Veterans. Thus, it is not possible to evaluate differential effects for higher levels of combat exposure within these cohorts.

Other studies have taken a slightly different approach to the question of whether combat exposure has a similar impact on women and men at different levels of combat exposure. For example, one study examined gender differences in rates of PTSD within three levels of combat exposure (i.e., low, medium, high) in a sample of OEF/OIF service members (MHAT-IV, 2006). No significant differences on PTSD emerged between men and women for either low or medium combat levels, although female soldiers were significantly more likely than male soldiers to screen positive for general mental health problems in the low combat condition (17% compared to 9%). Given that only 6% of the women had combat experience scores that qualified them for the high combat group, the researchers were unable to determine if there were gender differences in mental health status under conditions of high combat.

While studies within this category represent a significant advance over previous research, as discussed earlier, even when women and men report similar levels of combat exposure, the nature of their specific combat experiences may differ. Therefore, additional research is needed to examine whether there are important gender differences in the nature of specific combat stressors experienced by women and men and whether these differences are differentially associated with mental health outcomes. In addition, the context within which women and men experience combat may differ substantially, and women may face unique challenges associated with their postdeployment readjustment. These issues are discussed in greater detail later in this review.

As this review of the literature demonstrates, there is a need for additional research on gender differences in combat exposure and associated consequences for postdeployment mental health. Our review of the literature revealed only a handful of studies that have addressed this issue among those deployed in support of OEF/OIF, and results based on this cohort, as well as prior on cohorts, have been mixed. Although some studies provide evidence that combat experiences may have a slightly stronger negative impact on women than men, a number of others studies do not support this conclusion. Thus, definitive conclusions regarding gender differences in combat experiences and their consequences for postdeployment health must await additional empirical inquiry.

2. Sexual assault and sexual harassment

While traumatic combat experiences are most closely associated with service in OEF/OIF, they are certainly not the only potentially traumatic experiences that women may encounter in the war zone. Unfortunately, deployed women may also be exposed to interpersonal stressors during deployment, including experiences of sexual assault, sexual harassment and gender-based harassment. While these interpersonal stressors do impact male service members as well, female gender confers a higher risk of experiencing these events during military service (Murdoch, Pryor, Polusny, & Gackstetter, 2007; Street, Gradus, Stafford, & Kelly, 2007; Vogt et al., 2005).

At the most severe end of the sexual stress continuum is sexual assault, or experiences of unwanted physical sexual contact that involve some form of coercion, ranging from unwanted touching to attempted or completed rape. Experiences of sexual harassment include a wide range of events which are, by definition, stressful. Sexual harassment includes coerced sexual involvement that is a condition of employment or used as the basis of employment related decisions (e.g., in exchange for maintaining a more desirable duty assignment, to avoid an unfair performance evaluation). Sexual harassment also includes any sexual behaviors that create an intimidating, offensive or hostile work environment (e.g., making repeated, offensive comments about a person's sexual activities, making frequent unwanted sexual advances).

An increased incidence of these types of sexual stressors is associated with workplaces that are traditionally male-dominated and characterized by relatively large power differentials between organizational levels (Ilies, Hauserman, Schwochau, & Stibal, 2003; Lafontaine & Tredeau, 1986). Given that these types of organizational characteristics are representative of military settings, it is not

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surprising that these experiences are a too common aspect of military service for female service members (Rosen & Martin, 1998a; Sadler, Booth, Nielson, & Doebbeling, 2000; Skinner et al., 2000; Street, Stafford, Mahan, & Hendricks, 2008; Wolfe et al., 1998). Recent population-based data (Lipari, Cook, Rock, & Matos, 2008) indicate that, within the past year, 9% of military women reported experiencing some form of sexual coercion, such as feeling threatened with retaliation for not being sexually cooperative or believing better assignments or better treatment was implied if they were sexually cooperative. A higher proportion of military women, 31%, reported experiencing some other form of unwanted sexual attention in the past year, including unwanted attempts to establish a romantic sexual relationship despite the service member's efforts to discourage it or being touched in a way that made the service member feel uncomfortable. Over half of military women, 52%, reported experiencing other offensive sexual behaviors such as repeatedly being told offensive sexual stories or jokes or experiencing unwelcome attempts to be drawn into a discussion of sexual matters.

While there have been no large-scale investigations of the prevalence of these experiences among troops deployed to Iraq and Afghanistan, reports to VA healthcare providers in response to mandated healthcare screenings indicate that experiences of sexual trauma represent a substantial deployment-related stressor among this population (Kimerling et al., under review). Additional evidence of the role of sexual trauma among deployed troops can be found in investigations of sexual stressors among troops deployed in support of the Gulf War (Kang, Dalager, Mahan, Ishii, &, 2005; Vogt et al., 2005; Wolfe et al., 1998). These investigations are not true prevalence studies and differences in measurement of the constructs of interest across studies preclude definitive conclusions about the frequency of sexual harassment and sexual assault victimization during war zone deployments. However, these investigations do demonstrate that sexual trauma victimization during warzone deployments represents a potentially traumatic experience impacting a substantial number of female service members.

Such experiences of sexual stress are of great concern because these experiences are associated with significant negative mental health consequences. In the civilian community, sexual assault has been identified as a traumatic event with one of the highest risk probabilities for developing PTSD (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995; Tolin & Foa, 2006) and sexual harassment has long been identified as a stressor with negative mental health consequences (Barling et al., 1996; Dansky & Kilpatrick, 1996; Magley, Hulin, Fitzgerald, & DeNardo, 1999). Extensive data with military and Veteran samples indicates that experiences of sexual assault and harassment during military service are associated with mental health problems like PTSD, depression, other anxiety disorders and substance abuse (Butterfield, McIntyre, Stechuchak, Nanda, & Bastian, 1998; Hankin et al., 1999; Kimerling, Gima, Smith, Street, & Frayne, 2007; Murdoch et al., 2007; Skinner et al., 2000), physical health symptoms and chronic health problems (Frayne et al., 1999; Martin, Rosen, Durand, Knudson, & Stretch, 2000; Sadler et al., 2000) and difficulty with occupational and financial readjustment following discharge from the military (Sadler et al., 2000; Skinner et al., 2000). Consistent with this perspective, while experiences of combat exposure and sexual assault during deployment were both strong predictors of PTSD among a sample of Gulf War Veterans, sexual assault emerged as a stronger predictor (Kang et al., 2005). Additionally, preliminary evidence suggests that sexual trauma experienced during military service is more strongly associated with mental health conditions like PTSD than is sexual trauma experienced before or after military service (Himmelfarb, Yaeger, & Mintz, 2006). While the specific mechanisms for this increased toxicity have not been directly examined, these strong associations may be due to particularities of the military environment, including victims' perceptions that escape is not possible, feelings of betrayal at being victimized by fellow service members and beliefs that if they report their victimization experiences victims will experience negative repercussions (Street, Kimerling, Bell, & Pavao, in press).

While not yet subjected to empirical examination, theoretically, sexual assault or harassment experienced during a combat deployment may be even more psychologically damaging than similar events experienced in peacetime settings. During combat operations military units are expected to function as a cohesive group with a shared mission, for which they have made many sacrifices and put their lives in danger. Under these circumstances victimization at the hands of "soldiers in arms" may feel like an even greater betrayal for sexual trauma victims. Additionally, sexual trauma in the context of a combat operation, where perceived threats against one's safety are widespread, is likely to be experienced as even more threatening to one's wellbeing. The only existing data on the mental health effects of sexual trauma among Veterans deployed to Iraq and Afghanistan is drawn from a sample of VA healthcare users. In this sample, female OEF/OIF Veterans who experienced sexual trauma were 3.5 times more likely to be diagnosed with a mental health condition than were female OEF/OIF Veterans who had not experienced sexual trauma, suggesting that even among this sample of deployed Veterans at risk for experiencing mental health problems, sexual trauma is a significant risk factor for negative mental health (Kimerling et al., under review).

Perhaps most notably, women who experience sexual trauma during a combat deployment may be experiencing these events in the context of other types of trauma exposure, including combat trauma. There is data from civilian populations indicating that exposure to multiple types of traumatic events increases the risk of negative mental health effects (Breslau, Chilcoat, Kessler, & Davis, 1999). Further, data from military samples indicating that prior exposure to sexual or physical assault increases the risk of mental health problems following combat exposure (Smith, Wingard et al., 2008b). These data suggest that exposure to both combat and sexual trauma is likely to have significant negative effects on the readjustment of women Veterans subjected to these experiences. It may be that the effects of this dual trauma exposure are additive, meaning that both combat and sexual trauma contribute independently to negative mental health. As such, experiencing both types of trauma would lead to greater negative mental health consequences than would exposure to a single type of trauma exposure, as if the negative effects of sexual trauma were "added on top of" the negative effects of combat trauma. Alternatively it may be that the effects of this dual trauma exposure are multiplicative, suggesting that the effects of exposure to both types of trauma would be "much worse than the sum of their parts" (i.e. an interaction effect). This would indicate that the mental health effects of exposure to combat trauma are far worse for those who have already experienced sexual trauma, and vice versa. Additional research with OEF/OIF samples involving careful measurement of exposure to combat trauma and sexual trauma is necessary to clarify the specific mechanisms by which this dual trauma exposure impacts women Veterans.

3. Exposure to other interpersonal stressors

Female military personnel are also at increased risk of experiencing gender harassment, behaviors that are not sexually-based, but are hostile or degrading and occur on the basis of one's biological sex. Gender harassment is often used to reinforce traditional gender roles and includes behaviors such as putting someone down based on their gender, making offensive remarks about a particular gender or treating members of one gender as if they must work harder than others to prove themselves. While both men and women may experience gender harassment, women are more likely than men to be confronted with these types of experiences (Rosen & Martin, 1998b; Vogt et al., 2005). Often conceptualized as a specific subtype of sexual harassment, gender harassment occurs more frequently that

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other forms of sexual harassment (Fitzgerald, Magley, Drasgow, & Waldo, 1999; Lipari et al., 2008), with recent data indicating that 54% of military women experience some form of gender harassment annually (Lipari et al., 2008). Experiences of gender harassment are associated with negative mental health outcomes for female service members (Rosen & Martin, 1998a; Rosen & Martin, 1998b) and for female Veterans deployed in support of the Gulf War (King, King, Vogt, Knight, & Samper, 2006). While gender harassment and sexual harassment are likely to co-occur, gender harassment has unique effects on mental health that extend beyond sexual harassment. In fact, research suggests that military women perceive gender harassment as a greater problem than sexually-based harassment (Rosen & Martin, 1998a). While most gender harassment experiences would not qualify as DSM-IV Criteria A traumatic events, these types of experiences likely represent a chronic and severe stressor for some women in the military. Incidents of gender harassment may be experienced as particularly threatening in the context of combat operations, when positive relationships among unit members are critical to maintaining the safety of the entire unit.

Another interpersonal stressor that is defined by the lack of positive interpersonal relationships, rather than the presence of stressful interpersonal interactions is lack of social support during deployment. While this issue has not yet been empirically examined in the OEF/OIF cohort, there is some evidence that deployed women may be less likely to experience positive social support from fellow service members. Among samples deployed for the Gulf War, female service members reported lower perceptions of support from their peers and superiors than their male counterparts (Rosen, Wright, Marlowe, Bartone, & Gifford, 1999; Vogt et al., 2005). Women's lower perceived social support is particularly noteworthy given that socially supportive relationships among military personnel have been identified as a major resilience factor for military-related stressors, including those associated with combat exposure (Bliese, 2006; Griffith & Vaitkus, 1999). Indeed, service members' perception of supportive peers and unit leadership is associated with improved psychological well-being and perceptions of combat readiness (Griffith, 2002). Additionally, cohesive relationships among unit members has been demonstrated to ameliorate the association between stressors and PTSD among military personnel (Brailey, Vasterling, Proctor, Constans, & Friedman, 2007). It has been hypothesized that perceptions of support from other military personnel are particularly critical in a war zone, when strong unit cohesion can engender confidence and promote adaptive problem solving among members of a unit under attack (Griffith & Vaitkus, 1999). This suggests that for deployed women, the experience of exposure to war zone stressors may be exacerbated by perceived lack of support from their comrades.

In summary, while the mental health effects of exposure to combat and related deployment stressors are a significant concern for women returning from service in Iraq and Afghanistan, deployed women are also at risk for experiencing significant sexual stressors including sexual assault and sexual harassment. Further, deployed women may experience other significant interpersonal stressors that may exacerbate the effects of exposure to other warzone stressors, including gender harassment and limited social support from other military personnel. Of course, war zone stressors are not the only factors to impact postdeployment mental health adjustment. In the next section, we review research on women's exposure to premilitary trauma, given that these experiences may be implicated in both women's exposure to warzone stressors and their adjustment following these experiences.

4. The role of premilitary and postmilitary interpersonal trauma

Research with military populations has demonstrated that the experience of multiple traumatic events across the lifespan can have a cumulative or 'additive' negative impact on Veterans' postdeployment adjustment and well-being (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993; Green, Grace, Lindy, Gleser, & Leonard, 1990; Zinzow, Grubaugh, Monnier et al., 2007b). Further, experiences of trauma exposure prior to military service are predictive of Veterans' future exposure to potentially traumatic events during and after military service (Himmelfarb et al., 2006; Suris & Lind, 2008; Vogt, King, & King, 2007). That is, Veterans with prior trauma histories may be more vulnerable to subsequent trauma exposure, as individuals who experience traumatic stress may lose or feel unable to access resources, like adaptive coping skills, social support, housing, and employment, likely to protect them from additional stressor exposure (Hobfoll, Dunahoo, & Monnier, 1995), given that such resources may become depleted or unavailable over the course of multiple trauma exposure.

While little research is available on this topic as it specifically applies to OEF/OIF Veterans, data across a range of cohorts have consistently demonstrated that female service members and Veterans are more likely to endorse premilitary trauma than their male counterparts, and some studies have suggested that that this population is also more likely to report sexual trauma than civilian women (see Zinzow et al., 2007b for a review). The most recently available data drawn from studies published between 2002 and 2007 suggest that over half the population of women Veterans experienced premilitary physical or sexual abuse. More specifically, Zinzow and colleagues (2007b) report that at least one-third of women Veterans endorse a history of childhood sexual abuse, with a similar proportion having experienced adulthood sexual assault, representing higher proportions of the population than that of civilian women, of which 17% to 22% report childhood sexual abuse and 13% to 22% endorse adulthood sexual assault. By comparison, a strikingly small proportion (<7%) of male Veterans endorse any experience of sexual assault during their lifetime (Chang, Skinner, Zhou, & Kazis, 2003; Zinzow, Grubaugh, Frueh et al., 2007a), although this may be an underestimate given some men's strong reluctance to disclose such experiences (Felson & Pare, 2005).

Research has further demonstrated that, compared to civilian populations, Veteran women report more severe childhood abuse experiences, in that they are more likely to endorse childhood sexual abuse by a parent and a longer duration of childhood sexual abuse (Schultz, Bell, Naugle, & Polusny, 2006). These data are particularly concerning given the impact that premilitary trauma may have on women Veterans' postdeployment adjustment. There is some evidence that premilitary trauma increases women Veterans' risk of developing PTSD following combat exposure. Among a sample of Gulf War Veterans, for example, even after controlling for premilitary psychiatric history and level of combat exposure, women who endorsed premilitary trauma reported significantly higher levels of combat-related PTSD symptoms, an association that did not hold true for the men (Engel et al., 1993). A similar relationship has not been found with respect to sexual assault in the military, however, as Yaeger, Himmelfarb, Cammack and Mintz (2006) found that prior trauma experiences did not impact the relationship between military sexual assault and PTSD. Notwithstanding this finding, however, the available data suggest that the issue of premilitary trauma is particularly relevant for Veteran women and, therefore, worthy of careful consideration with respect to its impact on this population's postdeployment adjustment. Unfortunately, women Veterans' increased risk of interpersonal trauma may not be limited to premilitary experiences. While little research has addressed this question directly among military women, female Veterans may also be at increased risk for interpersonal victimization following their military discharge. Demographic data indicates that military women are five times more likely than non-military women to marry another service member (Joint Economic Committee, 2007). Given the frequency of intimate partner violence perpetrated by male veterans and service members

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(Rentz et al., 2006) and the associated likelihood of victim injury when intimate partner violence occurs among this population (Marshall, Panuzio, & Taft, 2005), domestic violence victimization may be a significant issue for many women Veterans. Concerns about post-military interpersonal victimization may be even more relevant for women Veterans given growing evidence that exposure to earlier potentially traumatic events, as well as PTSD symptoms associated with those events, act as risk factors for subsequent trauma exposure, with the preponderance of evidence focusing on later risk for interpersonal traumas like intimate partner violence victimization and sexual victimization (Cougle, Resnick, & Kilpatrick, 2009; Krause, Kaltman, Goodman, & Dutton, 2006). Given evidence reviewed earlier that women Veterans are at increased risk for a range of premilitary and military interpersonal traumas and associated PTSD symptoms, it is likely that women Veterans may be at particular risk for subsequent revictimization. Evidence from civilian samples indicating that the mental health consequences associated with trauma victimization worsen in the face of multiple trauma exposures (Cloitre, Scarvalone, & Difede, 1997; Follette, Polusny, Bechtle, & Naugle, 1996) suggests that multiple exposure to interpersonal victimization across the lifespan may result in an even more complex set of post-trauma mental health symptoms for some women Veterans.

5. Homecoming readjustment

Veterans' homecoming readjustment experiences may play an important role in their postdeployment well-being. Experiences related to readjustment to the family primary caregiver role, public and personal perceptions of the "Veteran woman" identity, and access to postdeployment healthcare services may be especially salient for women returning from deployment. While little research has examined the impact of these factors on OEF/OIF Veteran women's postdeployment adjustment, the studies that are available can elucidate our understanding of these experiences' relevance to this population.

5.1. Readjustment to the family primary caregiver role

Because the family system is a critical source of social support for many, it is important to consider the impact of Veterans' separation from and reintegration into the family system as a consequence of deployment. This issue may be particularly relevant to Veteran women, given concerns about family/relationship disruptions are more strongly associated with postdeployment mental health for female than male service members (Vogt et al., 2005). These findings suggest that deployment may be particularly stressful for some military mothers who must manage their family responsibilities from afar, potentially exposing female service members to the dual stress associated with both warzone and family-related concerns. This stress may be exacerbated for some by the ease of communication by phone or e-mail with family back home that is unique to contemporary wars.

Similar proportions of women (38%) and men (44%) in the military are parents and approximately 40% of military parents have children under the age of 5 (Joint Economic Committee, 2007). Military mothers, however, are three times more likely to be single parents and five times more likely to be married to a military spouse who is also eligible for deployment (Joint Economic Committee, 2007). Military mothers are also likely to be young (<age of 25) and of lower socioeconomic status (Joint Economic Committee, 2007). Further, Veteran women are more likely to divorce and remain divorced when compared to their male Veteran counterparts and to age matched civilian women (Adler-Baeder, Pittman, & Taylor, 2005). These data highlight the unique family-related challenges that some female OEF/OIF Veterans may face with respect to issues such as arranging for appropriate childcare and concern about their family's welfare during deployment. Such issues may be particularly challenging for service members who are deployed from the National Guard or Reserves, since these women may be less likely than women deployed from active duty to have an infrastructure in place to address their childcare and domestic needs during deployment, particularly if they were their family's primary caregiver prior to deployment.

Research has demonstrated that parental separation early in life can lead to disruptions in the mother–child attachment system (Bowlby, 1973). Some OEF/OIF mothers may, therefore, be faced with parenting challenges postdeployment, given that they may return home to care for children exhibiting behavioral problems. These challenges may be particularly stressful for mothers who are struggling with their own postdeployment mental health issues or for single mothers, who are more likely to report both depressive symptoms and poor family functioning during the postdeployment period (Kelley, Herzog-Simmer, & Harris, 1994; Kelley et al., 2002). While research has yielded mixed results with respect to the impact of maternal deployment on children's functioning, some studies have shown that children of deployed mothers are more likely to exhibit behavioral problems than non-deployed active duty and civilian mothers (Kelley et al., 2001; Pierce, Vinokur, & Buck, 1998). However, the evidence suggests that these problems, as well as the postdeployment stress experienced by the children and family of returning OEF/OIF Veterans, are likely to dissipate over time (Pierce et al., 1998) (Faber, Willerton, Clymer, MacDermid, & Weiss, 2008). Additional research in this area is warranted to identify the long-term impact these stressors may have on Veteran women and their families.

5.2. Postdeployment resources: Women veterans' healthcare services

Another factor relevant to OEF/OIF Veteran women's postdeployment homecoming adjustment pertains to the availability of resources designed to meet their unique needs. This is likely to be of great importance given the growing number of Veteran women faced with financial hardship, evidenced by data demonstrating Veteran women are two to four times more likely than their civilian counterparts to be homeless (Gamache, Rosenheck, & Tessler, 2003). One increasingly important resource for meeting women Veterans needs is the availability of appropriate healthcare. VA healthcare services for women have become more widely available since Congress issued the Veterans Health Care Act (1992) in response to concerns that Veteran women's healthcare needs were not being met. In 2009, the VHA Office of Public Health and Environmental Hazards released data indicating that 46% of all OIF/OEF female Veterans have attended at least one outpatient appointment at the VA, compared to 43% of the male Veteran population. Approximately 44% of the women Veterans continued to receive ongoing care at the VA (i.e., attended over 10 outpatient sessions), compared to 35% of the male Veterans (VHA Office of Public Health and Environmental Hazards, 2009). However, many women may continue to experience or perceive barriers to accessing these services. Studies examining factors that influence women Veterans' use of VA healthcare services have revealed that difficulties related to the logistics of care (e.g., long wait times to access care, lack of knowledge about eligibility for VA healthcare services) may be particularly relevant for women Veterans (Vogt et al., 2006). Additional barriers, including for example, concerns about limited privacy available to women and negative perceptions of the quality of VA care (Washington, Yano, Simon, & Sun, 2006) may also be significant barriers to VA use by women Veterans. While some male Veterans may face similar logistical and perceptual barriers, given that women Veterans represent a minority of the VA healthcare population, these issues are likely to be more salient for this group. Notwithstanding the key efforts by Congress and the VA to increase the amount and quality of services offered to Veteran women, including the availability of evidenced-based therapies like Cognitive Processing Therapy and Prolonged Exposure to treat the aftereffects of PTSD secondary to sexual and/or combat

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trauma, these data suggest that a problem related to women Veterans' access to services may simply be getting them "in the door."

While Veteran women may face obstacles related to seeking VA services because of their gender, they may also experience difficulty accessing healthcare services at non-VA facilities as a function of their Veteran status. Since non-VA female healthcare providers may not have training or experience in serving Veteran populations, Veterans may be concerned that such providers will not have the knowledge or skills required to address their unique healthcare needs. While little research is available with respect to such quality of care, which is likely to differ from provider to provider, it is possible that women Veterans' perceptions of their needs as unique keeps them from seeking and receiving needed post-deployment healthcare services at non-VA facilities.

5.3. Perceptions of the "Veteran woman" identity

Another factor that may impact Veteran women's homecoming adjustment experience is that of the "Veteran woman" identity. Although this topic has received little empirical examination, the fact that women have not been extensively exposed to combat until recent wars may impact the general public's perception of women Veterans. While our society has made great strides towards the acceptance of women as Veterans over recent decades, some sectors of society may not yet comfortably embrace this concept and some women's homecoming experience may, therefore, be impacted by the perception that women are not "real Veterans" or that they are not exposed to "real danger" relative to Veteran men. This may cause them to feel unsupported, invalidated, or unappreciated for their service, which as demonstrated among prior Veteran cohorts, can make the homecoming experience particularly stressful (Johnson et al., 1997; Orsillo, Heimberg, Juster, & Garrett, 1996). In fact, a study of Vietnam Veteran women demonstrated that unsupportive homecoming reception significantly mediated the relationship between trauma exposure and postdeployment PTSD (Fontana, Schwartz, & Rosenheck, 1997).

6. Future directions: Where do we go from here?

This review of the literature on factors that may impact post-deployment mental health adjustment among women serving in war zones in Iraq and Afghanistan highlights a number of areas in need of further investigation. Across almost all topic areas addressed by this review, due in part to the fact that these wars are still ongoing, there is a need for additional studies that include larger subsamples of women in order to allow for sufficient power to analyze gender differences. For example, we were unable to identify a single study in our review of gender differences in combat experiences that oversampled women so that there were equal numbers of both men and women in the sample. Fortunately, the majority of studies reviewed here were large-sample studies which provided sufficient subsamples of women to allow for gender-specific analyses.

A number of areas are in need of additional research. For example, systematic research has not yet described the combat experiences of women deployed in support of OEF/OIF. As reviewed here, even when women and men report similar levels of combat exposure, the nature of their specific combat experiences may differ. Therefore, additional research, including larger samples of women and applying careful sampling strategies to ensure that data are representative of the larger population, is needed to examine whether there are important gender differences in the nature of specific combat experiences. Further, studies of deployed military personnel designed to address the impact of combat exposure on mental health must oversample female service members relative to their frequency in the population to capture all levels of combat exposure in order to answer these important questions regarding gender difference. Research that incorporates more sophisticated operationalizations of combat exposure, which encompass the full range of potential exposures for all service members, are necessary to accurately address the differential impact of war zone service on women and men.

Empirical data on experiences of sexual trauma victimization among female service members deployed to Iraq and Afghanistan is extremely limited. Similarly, data on other forms of interpersonal stress experienced by women in the war zone, including experiences of gender harassment and limited social support from other military personnel, is inadequate. Research is needed to identify the frequency of these experiences among OEF/OIF personnel, as well as research elucidating how the mental health consequences of these experiences may differ when they occur in the context of a warzone deployment. A primary gap in the research literature with regard to the differential context of women's vs. men's warzone experiences is the need for studies that examine the dual burden of exposure to combat experiences and sexual trauma.

Research data on the unique challenges faced by female service members following deployment is also extremely sparse. While this review has highlighted theoretically important issues, including difficulties with reintegration into the family system, parenting stress, access to appropriate healthcare and public validation of military service, these factors must be examined empirically among the OEF/OIF cohort to understand their actual impact for returning women Veterans. Longitudinal research designs that include predeployment assessments of mental health and follow Veterans over time to evaluate trajectories of change will be especially helpful in understanding the role of premilitary life events, combat and sexual trauma experienced in the war zone and post-deployment readjustment stressors on women's postdeployment mental health.

Additional research on these topics will influence the provision of clinical services, a critical outcome given that women Veterans are a growing proportion of the healthcare-seeking Veteran population. Future research endeavors should target improvement of healthcare services available to Veteran women, both within and outside of the VA. Potential areas of focus for outreach efforts could include educating this population about the quality of healthcare services that are available to meet their needs, as well as how these services may be accessed upon return from deployment. Educational initiatives targeted at Veteran women and healthcare providers might also focus on addressing any perceived or actual barriers that may interfere with women Veteran's access to quality healthcare services.

7. Conclusion

Understanding gender-specific issues in the post-deployment mental health readjustment of service members who have served in Iraq and Afghanistan has broad potential relevance, as this literature may shed light on the larger question of gender differences in the diagnosis and treatment of PTSD. Results based on the broader literature indicate that women are approximately twice as likely as their male counterparts to be diagnosed with PTSD (Tolin & Foa, 2006). However, there are also indications that the gender-specific risk of PTSD differs substantially by type of traumatic event. Accordingly, not only is it important to understand the gender-specific mental health consequences of traumatic war zone exposures so that a grateful nation can appropriately care for female service members as they return from combat deployments, but these findings may also contribute to a greater understanding of the larger scientific issues. The female OEF/OIF Veteran cohort provides a novel and important population for understanding the gender-relevant phenomenology of PTSD.

As a new generation of women warriors return from war, it is critical that mental health providers understand this cohort's unique war zone experiences and readjustment concerns. Given that most models of the impact of war zone deployment on mental health are predicated on the experiences of male service members, women's expanding role in combat operations presents both an opportunity and a challenge to adapt these models to more effectively capture the

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experiences of female service members. While research in this area is still in its infancy, this review highlights a number of topic areas that must be considered in order to understand the experiences of a new generation of women Veterans. The goal must be to prevent, when possible, trauma exposure in the war zone, to identify significant negative mental health effects associated with war zone deployment as early as feasible, and to facilitate access to evidence-based treatment for these mental health conditions in an effort to reduce the burden of illness for female, as well as male, service members.

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